REMARKS

The Examiner rejected claims 1-5, 11-14, 16-20 and 26-29 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fridge (US Pat. No. 4,648,053) in view of Chung (US Pat. No. 5,481,472).

The Examiner rejected claims 6-10 and 21-25 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fridge (US Pat. No. 4,648,053) in view of Chung (US Pat. No. 5,481,472) as applied to claim 1 further in view of Simard (US Pub. No. 2003/0202696).

The Examiner rejected claims 15 and 30 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fridge (US Pat. No. 4,648,053) in view of Chung (US Pat. No. 5,481,472) as applied to claim 1 further in view of DeCamp (US Pat. No. 6,063,132).

Applicants respectfully traverse the § 103 rejections with the following arguments.

35 U.S.C. § 103(a): Claims 1-5, 11-14, 16-20 and 26-29

The Examiner rejected claims 1-5, 11-14, 16-20 and 26-29 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fridge (US Pat. No. 4,648,053) in view of Chung (US Pat. No. 5,481,472).

Applicants respectfully contend that claims 1 and 16 are not unpatentable over Fridge in view of Chung, because Fridge in view of Chung does not teach or suggest each and every feature of claims 1 and 16.

As a first example of why claims 1 and 16 are not unpatentable over Fridge in view of Chung, Fridge in view of Chung does not teach or suggest the feature: "forming a first shape pattern".

The Examiner argues that Fridge discloses: "forming a first shape pattern (see col. 5 lines 47 – 52 – the template shown in fig 3 has an inner and outer region error boundary)".

In response, Applicants respectfully contend that the Examiner's argument is ambiguous and cannot be reasonably understood. In particular, the Examiner alleges that the claimed first shape is represented in Fridge by "the template shown in fig 3". However, the Examiner's referral to "the template shown in fig 3" lacks antecedent basis, because Fig. 3 of Fridge depicts two different templates, namely inner template 62 and outer template 64 as described in Fridge, col. 6, lines 17-19. By referring only to "the template" the Examiner has not communicated whether "the template" refers to inner template 62 or outer template 64.

In addition, the Examiner's statement that "the template shown in fig 3 has an inner and outer region error boundary" adds further ambiguity to the Examiner's identification of "the

template" because in Fig. 3 of Fridge, both inner template 62 and outer template 64 have only outer boundaries and do not have any inner boundaries.

Unfortunately, the Examiner's identification of "the template" makes no sense and is highly inconsistent with Fig. 3 of Fridge. The "template" described by the Examiner does not exist in Fig. 3 of Fridge. Thus, the Examiner's rejection of claims 1 and 16 is improper, because the Examiner has not presented a persuasive argument that Fridge discloses the claimed first shape.

Therefore, the Examiner has not established a *prima facie* case of obviousness with respect to claims 1 and 16.

As a second example of why claims 1 and 16 are not unpatentable over Fridge in view of Chung, Fridge in view of Chung does not teach or suggest the feature: "forming a second shape pattern, wherein the second shape pattern includes the first shape pattern and error shapes".

The Examiner argues that Fridge discloses: "forming a second shape pattern, said second shape pattern including the first shape pattern and error shapes (see col. 6 lines 17 – 24 – the conductive layer 70 is red as the second shape pattern)".

In response, Applicants respectfully contend that the Examiner's argument is incorrect. Since the Examiner alleges that the conductive layer 70 on FIG. 4 of Fridge represents the second shape pattern, Applicants maintain that the second shape pattern does not include the first shape pattern. If the Examiner considers the inner template 62 to represent the first shape pattern, then it is clear from Fig. 4 of Fridge that the conductive layer 70 does not include the inner template 72, because a portion of the inner template 72 is external to the conductive layer 70. If the

Examiner considers the outer template 64 to represent the first shape pattern, then it is clear from Fig. 4 of Fridge that the conductive layer 70 does not include the outer template 64, because a portion of the outer template 64 is external to the conductive layer 70.

In addition, Fridge does not disclose that "the second shape pattern includes ... error shapes". The Examiner alleges that the region 74 and the excess area 76 in FIG. 4 of Fridge represent the claimed error shapes. However, it is clear from FIG. 4 of Fridge that the region 74 and the excess area 76 are both located external to the conductive layer 70. Thus, the conductive layer 70 does not include the region 74 and does not include the excess area 76.

Therefore, Fridge does not disclose the preceding feature of claims 1 and 16.

As a third example of why claims 1 and 16 are not unpatentable over Fridge in view of Chung, Fridge in view of Chung does not teach or suggest the feature: "extracting the error shapes **from the second shape pattern**" (emphasis added).

The Examiner argues that Fridge discloses: "extracting the error shapes from the second shape pattern (see col. 6 lines 20 – 32 – the excess area is read as the error shapes as shown in fig 4 – 74 and 76)".

In response, Applicants respectfully contend that Fridge discloses that the region 74 and the excess area 76 are extracted from the printed circuit pattern in Fig. 4 of Fridge. However, Fridge does not disclose that the region 74 and the excess area 76 are extracted **from the second shape pattern** (i.e., the conductive layer 70) as required by claims 1 and 16.

Therefore, Fridge does not disclose the preceding feature of claims 1 and 16..

As a fourth example of why claims 1 and 16 are not unpatentable over Fridge in view of Chung, Fridge in view of Chung does not teach or suggest the feature: "deriving from a subset of the error shapes at least one environment shape corresponding to each error shape in the subset of the error shapes, said environment shape reflecting a local geometric environment of its corresponding error shape".

The Examiner argues that Fridge discloses: "deriving from a subset of the error shapes at least one environment shape corresponding to each error shape in the subset of the error shapes, said environment shape reflecting a local geometric environment of its corresponding error shape (see col. 4 lines 17 – 23 – the defects is enlarged for inspection, see fig 5 – where each component 172, 174, 176, and 178 – the enlarged image is read as the environment shape)."

In response, Applicants respectfully contend that the shapes 172 and 174 in Fig. 6 of Fridge are not derived from any error shapes (as required by claims 1 and 16) but rather are regular circuit board areas, as disclosed in Fridge, col. 9, lines 17-20.

In further response, Applicants respectfully contend that the shapes 176 and 178 in Fig. 6 of Fridge are themselves error shapes and are not derived from any error shapes (as required by claims 1 and 16), as disclosed in Fridge, col. 9, lines 20-27.

Therefore, Fridge does not disclose the preceding feature of claims 1 and 16.

As a fifth example of why claims 1 and 16 are not unpatentable over Fridge in view of Chung, Fridge in view of Chung does not teach or suggest the feature: "deleting a subset of the environment shapes **such that only unique environment shapes satisfying a selection criterion remain**" (emphasis added).

The Examiner argues that "Chung discloses deleting a subset of the environment shapes such that only unique environment shapes satisfying a selection criterion remain (see col. 11 lines 15 – 19 – the list contains information about shapes, see col. 1 lines 8 – 13, 50 – 55, some are removed and some are appended, the criterion is shown in fig 8 with MIN value and see col. 13 lines 1 – 5 as an example).

In response, Applicants respectfully contend that, although Chung discloses deleting shapes, Chung does not disclose deleting shapes **such that only unique environment shapes satisfying a selection criterion remain**".

Therefore, Fridge does not disclose the preceding feature of claims 1 and 16.

In addition, Applicants respectfully contend that the Examiner's argument for modifying Fridge by the alleged teaching of Chung is not persuasive.

The Examiner argues: "It would have been obvious to one having ordinary skill in the art at the time of the invention was made to include deleting a subset of the environment shapes because the number of data operated on during analysis for displacements is very much reduced and can be accomplished at very high speed (see col. 12 lines 11 – 17)".

In response, Applicants respectfully contend that Fridge does not disclose performing analysis for displacements. Thus, it is not obvious to incorporate the alleged teaching of Chung for the purpose of performing analysis for displacements.

Therefore, the Examiner has not established a *prima facie* case of obviousness with respect to claims 1 and 16.

Based on the preceding arguments, Applicants respectfully maintain that claims 1 and 16 are not unpatentable over Fridge in view of Chung, and that claims 1 and 16 are in condition for allowance. Since claims 2-5 and 11-14 depend from claim 1, Applicants contend that claims 2-5 and 11-14 are likewise in condition for allowance. Since claims 17-20 and 26-29 depend from claim 16, Applicants contend that claims 17-20 and 26-29 are likewise in condition for allowance.

In addition with respect to claims 4 and 19, Applicants respectfully contend that Fridge in view of Chung does not teach or suggest the feature: "wherein the grouping criterion relates to a combination of an area of the error shape and a smallest linear dimension of the error shape".

The Examiner argues: "With regards to claim 4, see the rejection for claim 2. In addition, the smallest grouping according to the doses from is grouping 25."

In response, Applicants respectfully contend that even if Fridge discloses grouping according to the doses, Fridge does not disclose grouping according to "a combination of an area of the error shape and a smallest linear dimension of the error shape" as required by claims 4 and 19.

Therefore, the Examiner has not established a *prima facie* case of obviousness with respect to claims 4 and 19.

In addition with respect to claims 5 and 20, Applicants respectfully contend that Fridge in view of Chung does not teach or suggest the feature: "expanding each error shape in the subset to form a corresponding expanded shape; and forming the at least one environment shape

corresponding to each expanded shape by removing all portions of the expanded shape which are common to the second shape pattern".

The Examiner has not even alleged that Fridge in view of Chung teaches or suggests "forming the at least one environment shape corresponding to each expanded shape by removing all portions of the expanded shape which are common to the second shape pattern".

Therefore, the Examiner has not established a *prima facie* case of obviousness with respect to claims 5 and 20.

In addition with respect to claims 12 and 27, Applicants respectfully contend that Fridge in view of Chung does not teach or suggest the feature: "wherein the N independent characteristics comprise at least two of: the vertex count of the environment shape, the area of the environment shape, and a perimeter of the environmental shape".

The Examiner has offered no argument relating to the preceding feature of claims 12 and 27.

Therefore, the Examiner has not established a *prima facie* case of obviousness with respect to claims 12 and 27.

In addition with respect to claims 13 and 28, Applicants respectfully contend that Fridge in view of Chung does not teach or suggest the feature: "wherein the extracting step comprises performing: (first shape pattern) XOR (second shape pattern)".

The Examiner argues: "With regards with claim 13, Fridge discloses all of the claim elements / features as discussed above in rejection for claim 1 and incorporated herein by

reference, but fails to disclose performing XOR on the first and second shape pattern. However, it is well known in the art for one skill in the art to use XOR function to extract error shapes (see MPEP 2144.03 official notice)."

In response, Applicants respectfully challenge the Examiner's invoking of Official Notice, because XOR is a logical operator that extracts error shapes according to very specific criteria and is thus not applicable to a large variety of shape extraction criteria. Therefore, Applicants respectfully request that the Examiner supply evidence to support the Examiner's use of official notice in alleging that "it is well known in the art for one skill in the art to use XOR function to extract error shapes".

Moreover, the Examiner's argument for modifying Fridge by extracting shapes by the XOR criteria is not persuasive.

The Examiner argues: "It would have been obvious to one having ordinary skill in the art at the time of the invention to include XOR function because the output of an XOR function of two different values (when the defect detected on the image being inspected is outside the region of the original template when compared, values having 'OFF' XOR 'ON") is an 'ON' value indicting the position of the defect of the error shape, and distinguishing from regions that does not have errors (when two input values are the same 'OFF' XOR "OFF" or 'ON' XOR 'ON')."

In response, Applicants respectfully contend that the preceding argument by the Examiner is not persuasive , because the XOR would not be effective in Fridge as evidenced by Fig. 4 of Fridge, which demonstrates that the error region in Fridge is not a result performing [(first shape pattern) XOR (second shape pattern)].

Specifically, error region 74 does not result from performing [region 62 XOR region 70]

or from performing [region 64 XOR region 70] . Similarly, error region 76 does not result from performing [region 62 XOR region 70] or from performing [region 64 XOR region 70].

Therefore, the Examiner has not established a *prima facie* case of obviousness with respect to claims 13 and 28.

In addition with respect to claims 14 and 29, Applicants respectfully contend that Fridge in view of Chung does not teach or suggest the feature: "wherein the error shapes comprises a plurality of additive shapes and a plurality of subtractive shapes".

The Examiner has not stated any motivation for modifying Fridge by the alleged teaching of Chung with respect to the preceding feature of claims 14 and 29.

Therefore, the Examiner has not established a *prima facie* case of obviousness with respect to claims 14 and 29.

35 U.S.C. § 103(a): Claims 6-10 and 21-25

The Examiner rejected claims 6-10 and 21-25 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fridge (US Pat. No. 4,648,053) in view of Chung (US Pat. No. 5,481,472) as applied to claim 1 further in view of Simard (US Pub. No. 2003/0202696).

Since claims 6-10 depend from claim 1, which Applicants have argued *supra* to not be unpatentable over Fridge in view of Chung under 35 U.S.C. §103(a), Applicants maintain that claims 6-10 are likewise not unpatentable over Fridge in view of Chung and further in view of Simard under 35 U.S.C. §103(a).

Since claims 21-25 depend from claim 16, which Applicants have argued *supra* to not be unpatentable over Fridge in view of Chung under 35 U.S.C. §103(a), Applicants maintain that claims 21-25 are likewise not unpatentable over Fridge in view of Chung and further in view of Simard under 35 U.S.C. §103(a).

35 U.S.C. § 103(a): Claims 15 and 30

The Examiner rejected claims 15 and 30 under 35 U.S.C. § 103(a) as allegedly being unpatentable over Fridge (US Pat. No. 4,648,053) in view of Chung (US Pat. No. 5,481,472) as applied to claim 1 further in view of DeCamp (US Pat. No. 6,063,132).

Since claim 15 depends from claim 1, which Applicants have argued *supra* to not be unpatentable over Fridge in view of Chung under 35 U.S.C. §103(a), Applicants maintain that claim 15 is likewise not unpatentable over Fridge in view of Chung and further in view of DeCamp under 35 U.S.C. §103(a).

Since claim 30 depends from claim 16, which Applicants have argued *supra* to not be unpatentable over Fridge in view of Chung under 35 U.S.C. §103(a), Applicants maintain that claim 30 is likewise not unpatentable over Fridge in view of Chung and further in view of DeCamp under 35 U.S.C. §103(a).

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 09-0456.

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Jack P. Friedman
Registration No. 44,688

Schmeiser, Olsen & Watts
22 Century Hill Drive - Suite 302
Latham, New York 12110
(518) 220-1850